

Date: Monday, 1/16/2006 4:18:14 PM  
 User: Kim Johnston

550

## Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : FWD TUBE ASSEMBLY
Job Number : 25515	
Estimate Number : 10467	
P.O. Number : N/A	Part Number : D3391021
This Issue : 1/16/2006 S.O. No. : N/A	Drawing Number : D3391 REV 01
Prsht Rev. : NC	Project Number : N/A
First Issue : N/A Type : MACHINED PARTS	Drawing Revision : <del>01</del> 05.04.12
Previous Run : 24865	Material : N/A
Written By : <u>SEE COMMENT BELOW</u>	Due Date : 2/13/2006
Checked & Approved By : <u>SEE ABOVE USER &amp; DATE</u>	Qty: <u>2</u> Um: Each
Comment : Est. A 05.09.13 New issue KJ/JLM	

## Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	D6013047	SKIDTUBE MAT'L
-----	----------	----------------



Comment: Qty: 1.0000 Each(s)/Unit Total : 2.0000 Each(s)  
 SKIDTUBE MAT'L

Pick:

Qty	Part Number	Description	Batch
1	D6013-047	Extrusion	B23935

2.0	LANDING GEAR 1	LANDING GEAR RESOURCE 1
-----	----------------	-------------------------



Comment: LANDING GEAR RESOURCE 1  
 Cut extrusion to 46.52 +0.010 -0.020

3.0	BENDING	BENDING MACHINE
-----	---------	-----------------



Comment: Nc bender  
 Bend as per Dwg D3391

DP 06-3-30

4

4.0	QC5	INSPECT WORK TO CURRENT STEP
-----	-----	------------------------------



Comment: INSPECT WORK TO CURRENT STEP

06/04/12  
060405  
 PTO

5.0	HAAS1	HAAS CNC VERTICAL MACHINING #1
-----	-------	--------------------------------



Comment: HAAS CNC VERTICAL MACHINING #1  
 1-Machine as per Folio FA590 Rev. AA & Dwg D3391 Rev. D  
 Identify as D3391-1  
 2-Deburr

06/04/12

4

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D3391-021 PAR #: N/A Fault Category: MACHINED PARTS NCR: Yes ☒ No ☐ DQA: [Signature] Date: 06/04/12  
 QA: N/C Closed: [Signature] Date: 06.04.27

NCR: <u>25515</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
06/04/12	5	Detail Z-2 of 4.250 is machined .100 over on the top side of -021 tube. Origin in to fix by .100 when tube flipped over.	<u>[Signature]</u>	Scrap and <sup>give to eng.</sup> <del>destroy</del> part. <u>Replace tube</u>	<u>[Signature]</u> 06/04/12	<u>[Signature]</u> 06/04/12	<u>[Signature]</u> 06/04/12	<u>[Signature]</u> 06/04/12

NOTE: Date & initial all entries

Date: Monday, 1/16/2006 4:18:14 PM  
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## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: FWD TUBE ASSEMBLY

Job Number: 25515

Part Number: D3391021

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

*ML 06/02/12 4*

7.0

QC8

SECOND CHECK



Comment: SECOND CHECK

*EP 06/04/20 4*

8.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill and c/sink float bag holes as per Dwg D3391 using DT8798(Do not open tow cap holes to finish size)  
(ONLY DRILL HOLES MARKED "A")

*BE 06-04-21*

2-Drill Remaining two holes for tow cap using DT 8819 Locating off of .1875" holes drilled in previous step

*BE 06-04-21*

3-Open tow cap holes to .208" as per Dwg D3391

*BE 06-04-21*

4-Open Tow Ring hole to .640" as per Dwg D3391

*BE 06-04-21*

5-Drill wearplate holes as per Dwg D3391 Using Dt8217

*BE 06-04-21*

6--Deburr

*BE 06-04-21*

9.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Acid etch and Alodine as per QSI 005 4.1

*a.m 06-04-21*

*(4)*

10.0

POWDER COATING

POWDER COATING



Comment: POWDER COATING

Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3

*DL 06/04/21*

*(4)*

11.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

*ML 06-03-21*

*(4)*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: FWD TUBE ASSEMBLY

Job Number: 25515

Part Number: D3391021

Job Number:



Seq. #:	Machine Or Operation:	Description :
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12.0	D3401041	Tow Cap Assembly
------	----------	------------------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 2.0000 Each(s)

Tow Cap Assembly

Pick:

Qty	Part Number	Description	Batch
1	D3401-041	Tow Cap	B25548

13.0	AN3C4A	BOLT
------	--------	------



Comment: Qty.: 4.0000 Each(s)/Unit Total : 8.0000 Each(s)

Bolt

Pick:

Qty	Part Number	Description	Batch
4	AN3C4A	Bolt	M19522

14.0	NAS1330C3KB166	
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Comment: Qty.: 24.0000 Each(s)/Unit Total : 48.0000 Each(s)

Rivnut

Pick:

Qty	Part Number	Description	Batch
24	NAS1330C3KB166	Insert	M100732

15.0	NAS1515H3	Washer
------	-----------	--------



Comment: Qty.: 4.0000 Each(s)/Unit Total : 8.0000 Each(s)

Washer

Pick: 4 AN960C10L washer M18822

Qty	Part Number	Description	Batch
4	NAS1515H3	Washer	M19185

DL 06/04/21

16.0	SMALL FAB 1	SMALL & MEDIUM FAB RESOURCE 1
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Comment: SMALL & MEDIUM FAB RESOURCE 1

Install inserts and Tow Cap as per Dwg D3391

Identify as D3391-021

DL 06/04/21

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Monday, 1/16/2006 4:18:14 PM  
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Drawing Name: FWD TUBE ASSEMBLY

Job Number: 25515

Part Number: D3391021

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

17.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP  
Inspect thread of each insert using DT8821

*mm*

*06 04 26*

*(4)*

18.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1  
Identify and Stock  
Location: FP

*DL*

*06/04/26*

*(4)*

19.0

DC

DOCUMENT CONTROL



Comment: DOCUMENT CONTROL  
Inspection Level 21

*DD*

*06/04/27*

*(4)*

Job Completion



*U 06.04.27*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

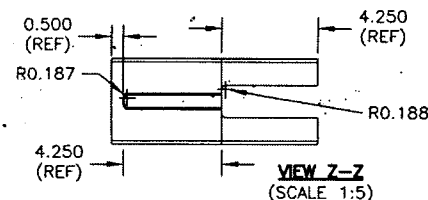
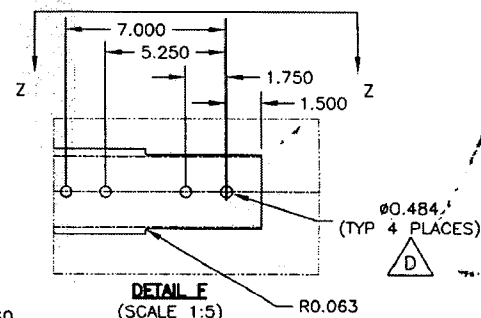
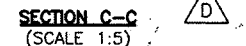
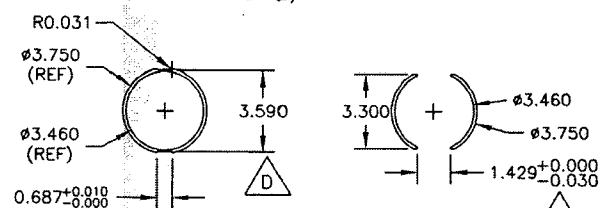
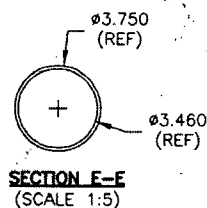
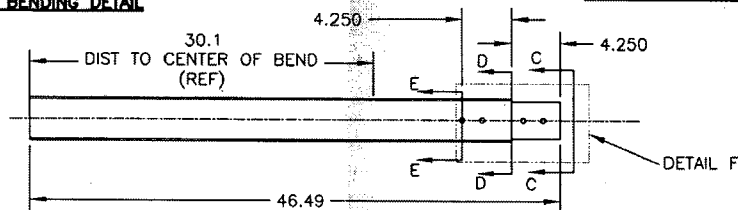
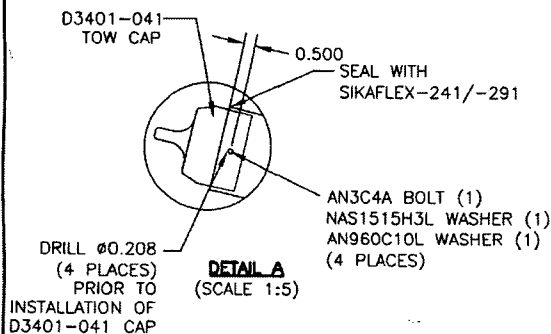
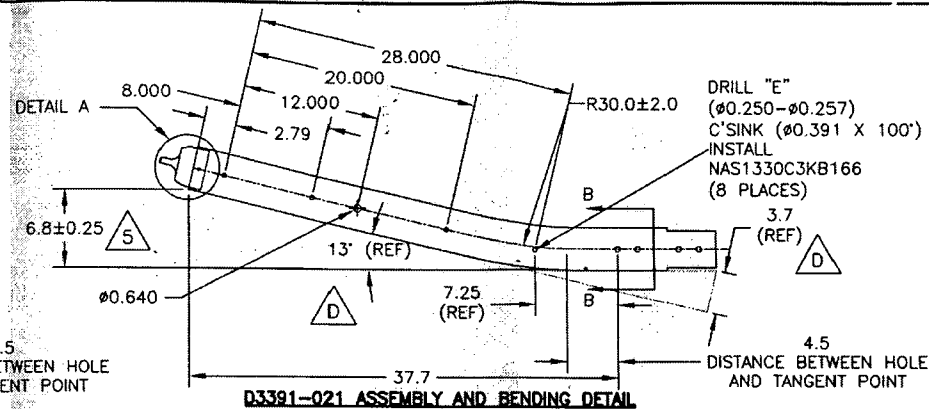
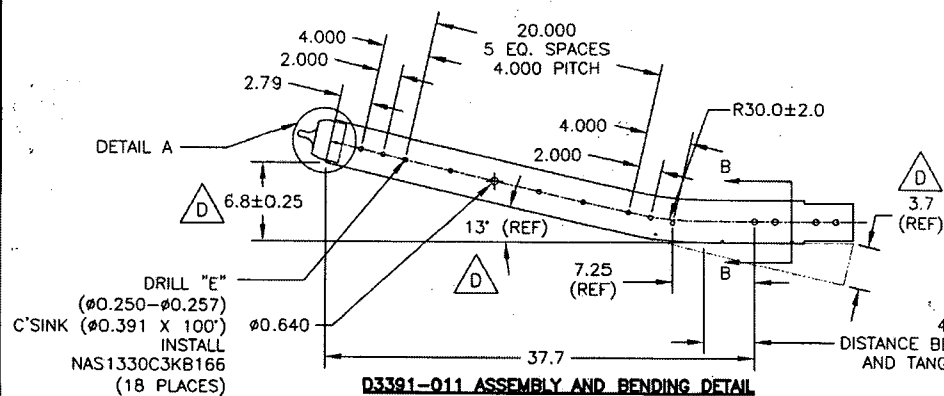
Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries





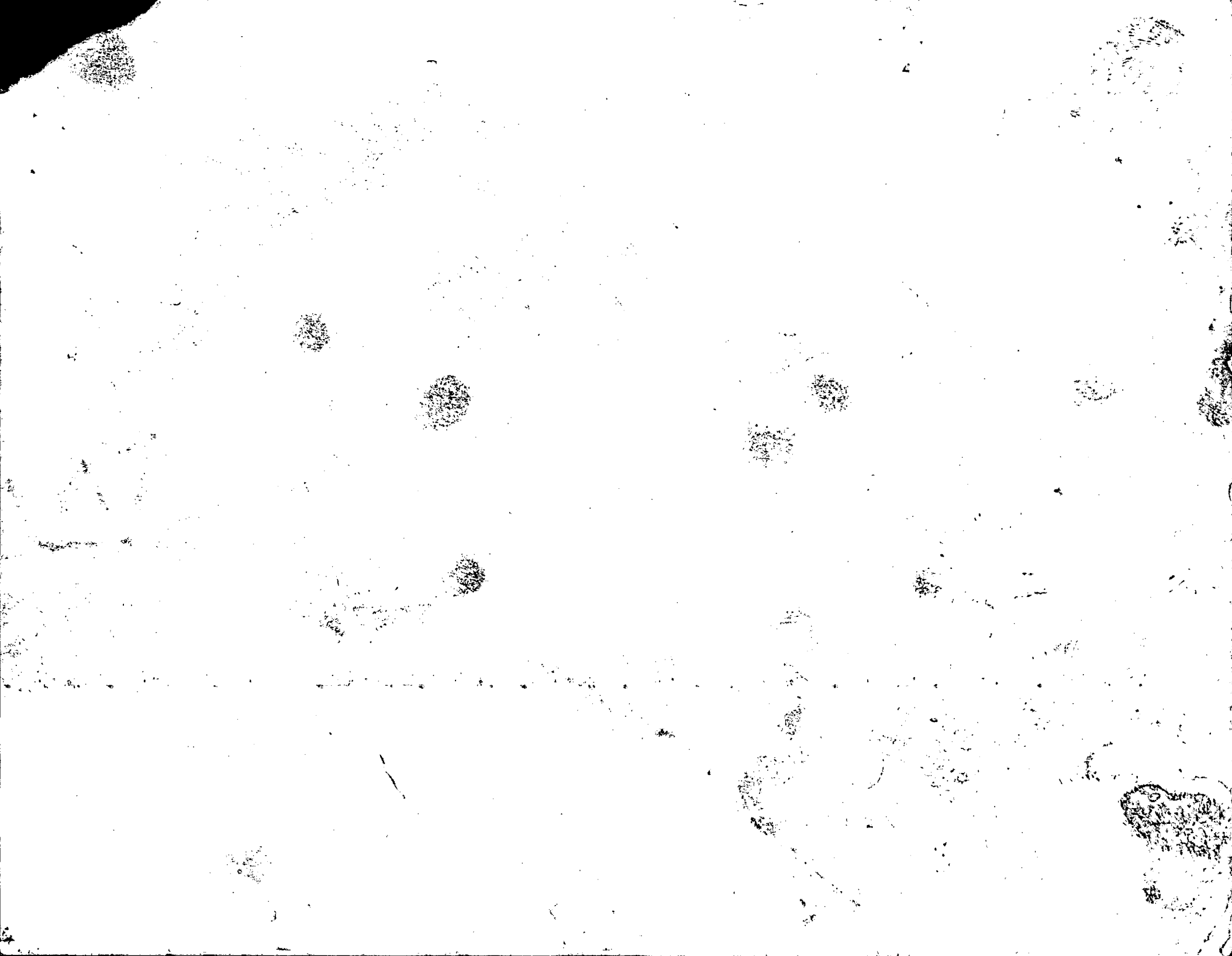
# D3391-011/-021 FWD TUBE ASSEMBLY PARTS LIST

QTY - 011	QTY - 021	PART NUMBER	DESCRIPTION
X	X	D3391-011	FWD TUBE ASSEMBLY
		D3391-021	FWD TUBE ASSEMBLY
1	1	D6013-047	FWD TUBE
1	1	D3401-041	TOW CAP
4	4	AN3C4A	BOLT
4	4	NAS1515H3L	WASHER
4	4	AN960C10L	WASHER
24	14	NAS1330C3KB166	INSERT

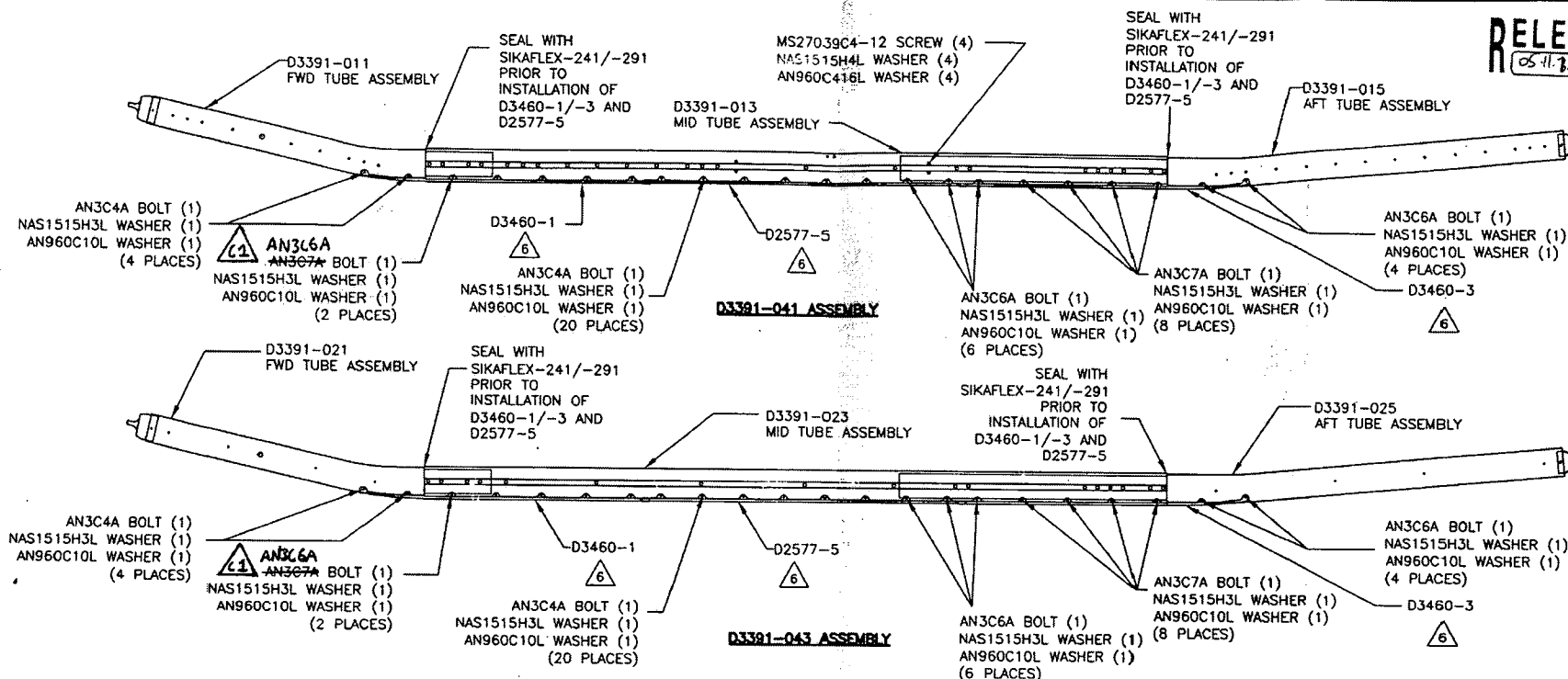
NO. 26567  
 WORK ORDER  
 WITHOUT NOTICE  
 SUBJECT TO AMENDMENT  
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 RETURN TO  
 SHOP COPY  
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 ENGINEERING

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DESIGN	PH	DRAWN BY	PH	DART	DART AEROSPACE USA, INC.
CHECKED	#	APPROVED	#	DRAWING NO.	REV. D
DATE	06.01.23	TITLE	412 FLOAT SKIDTUBE	SHEET 2 OF 5	SCALE 1:10



RELEASED  
05-11-74



**D3391-041/-043 FLOAT SKIDTUBE ASSEMBLY PARTS LIST**

QTY - 041	QTY - 043	PART NUMBER	DESCRIPTION
X	X	D3391-041	FLOAT SKIDTUBE ASSEMBLY
		D3391-043	FLOAT SKIDTUBE ASSEMBLY
1		D3391-011	FWD TUBE ASSEMBLY
1		D3391-013	MID TUBE ASSEMBLY
1		D3391-015	AFT TUBE ASSEMBLY
	1	D3391-021	FWD TUBE ASSEMBLY
	1	D3391-023	MID TUBE ASSEMBLY
	1	D3391-025	AFT TUBE ASSEMBLY
24	24	AN3C4A	BOLT
40-12	40-12	AN3C6A	BOLT
40-9	40-9	AN3C7A	BOLT
44	44	NAS1515H3L	WASHER
44	44	AN960C10L	WASHER
4	4	MS27039C4-12	SCREW
4	4	NAS1515H4L	WASHER
4	4	AN960C416L	WASHER
1	1	D2577-5	WEARSHOE
1	1	D3460-1	WEARSHOE
1	1	D3460-3	WEARSHOE

**GENERAL NOTES**

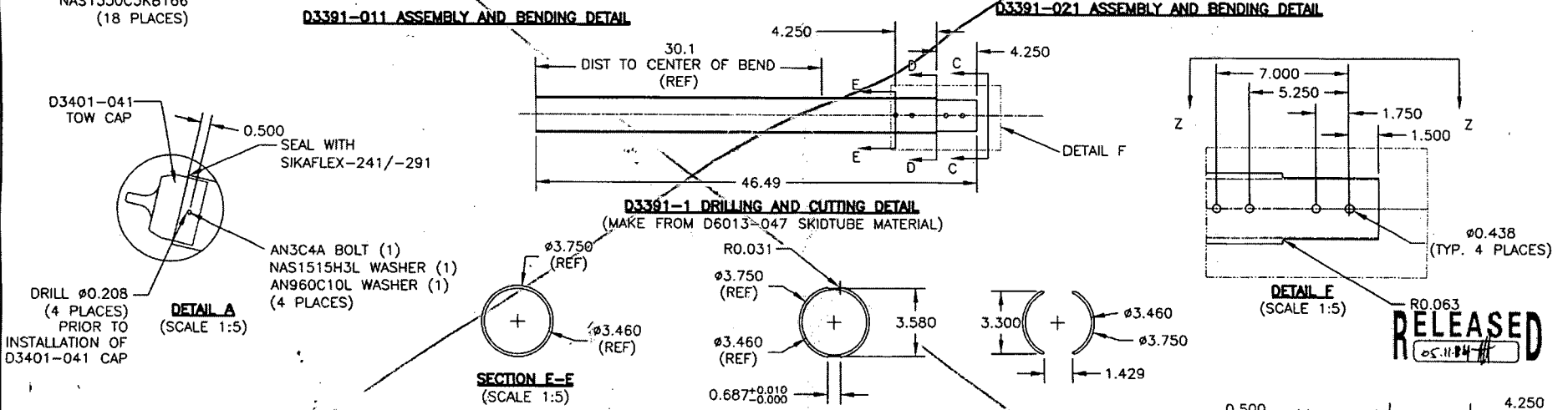
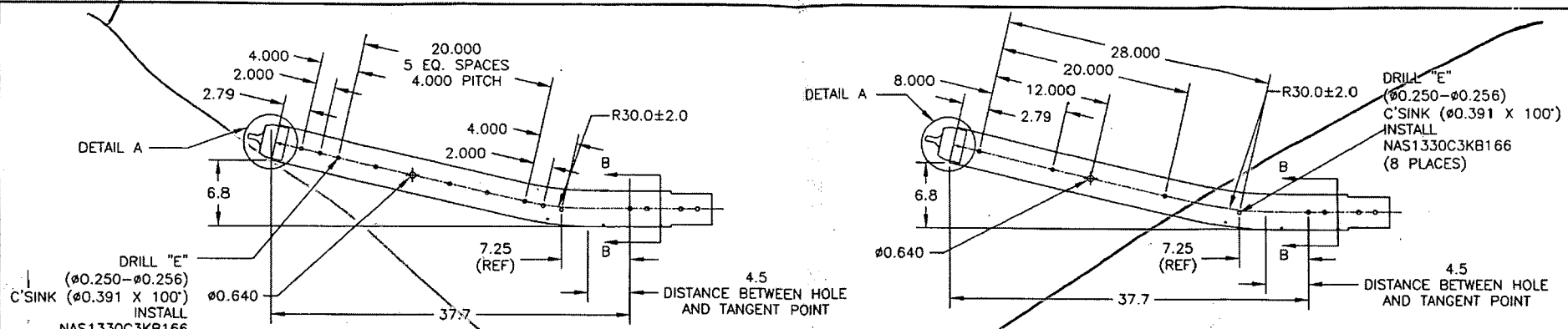
- ALL DIMENSIONS ARE IN INCHES
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- FINISH: ACID ETCH AND ALODINE PER DART QSI 005 4.1  
POWDER COAT WHITE (4.3.5.1) PER DART QSI 005 4.3
- SPRAY INSIDE OF TUBE WITH A COAT OF LPS LABORATORIES "LPS-3" AFTER FINISH AND AFTER INSTALLATION OF INSERTS. COAT ALL EXPOSED FASTENERS WITH LPS LABORATORIES "LPS PROCYON" AFTER FINAL ASSEMBLY. CLEAN EXCESS OFF POWDER COATING WITH MEK DEGREASER.
- USE DART DRILL TEMPLATE D78217 TO LOCATE AND DRILL 'E' SIZE HOLES (#0.250-#0.256) FOR WEARSHOE INSERTS. C'SINK #0.391/#0.425 x 100" AS APPLICABLE AND INSTALL INSERTS EXCEPT WHERE INDICATED.
- APPLY A LAYER OF SIKAFLEX -241/-291 ADHESIVE BETWEEN THE BOTTOM OF THE SKIDTUBE ASSEMBLY AND THE WEARPLATES

UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 25515

C	05.09.27	LENGTHEN AFT EXTENSION
B	05.06.10	DRAWING UPDATES
A	05.02.07	NEW ISSUE
DESIGN	DRAWN BY	<b>DART</b> DART AEROSPACE USA, INC. PORT HADLOCK, MA
CHECKED PH	APPROVED PH	DRAWING NO. D3391
DATE 05.09.27	TITLE 412 FLOAT SKIDTUBE	REV. 5 SHEET 1 OF 5 SCALE NTS

PH C1 05.11.30 CHANGE BOLT LENGTH  
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D3391 Rev. D  
06.04.12  
PH



**DRILL "E"**  
(Ø0.250-Ø0.256)  
C'SINK (Ø0.391 X 100')  
INSTALL  
NAS1330C3KB166  
(18 PLACES)

**DETAIL A**  
(SCALE 1:5)

**SECTION E-E**  
(SCALE 1:5)

**SECTION D-D**  
(SCALE 1:5)

**SECTION C-C**  
(SCALE 1:5)

**SECTION B-B**  
(SCALE 1:5)

**VIEW Z-Z**  
(SCALE 1:5)

**D3391-011/-021 FWD TUBE ASSEMBLY PARTS LIST**

QTY - 011	QTY - 021	PART NUMBER	DESCRIPTION
X		D3391-011	FWD TUBE ASSEMBLY
	X	D3391-021	FWD TUBE ASSEMBLY
1	1	D6013-047	FWD TUBE
1	1	D3401-041	TOW CAP
4	4	AN3C4A	BOLT
4	4	NAS1515H3L	WASHER
4	4	AN960C10L	WASHER
24	14	NAS1330C3KB166	INSERT

**DETAIL F**  
(SCALE 1:5)

**RELEASED**  
05.11.14

**VIEW Z-Z**  
(SCALE 1:5)

**WORK ORDER NO. 05515**

**UNCONTROLLED**

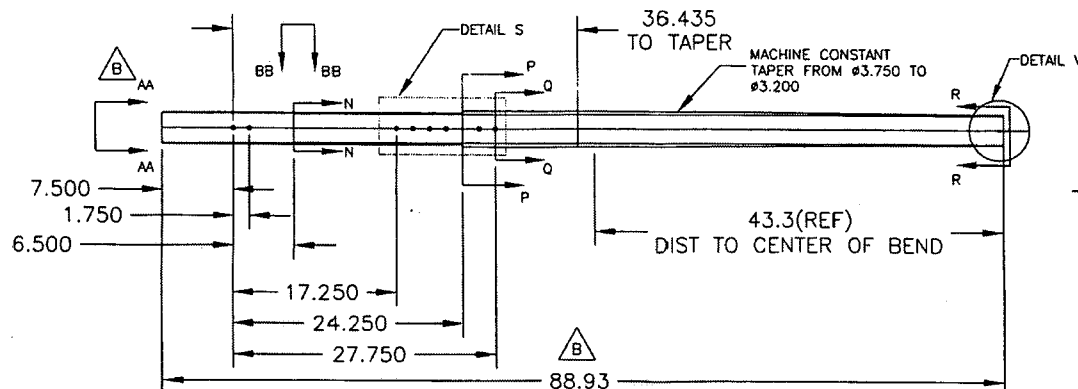
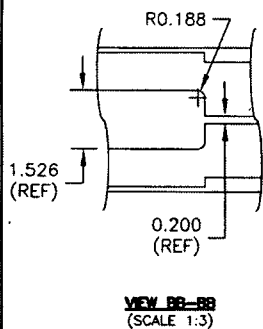
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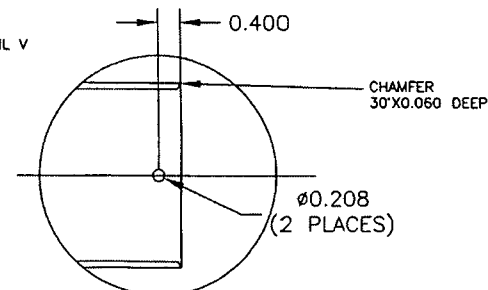
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CHECKED	PH	APPROVED	PH	DRAWING NO.	REV. C
DATE	05.09.27	TITLE	412 FLOAT SKIDTUBE		
					SHEET 2 OF 5
					SCALE 1:10





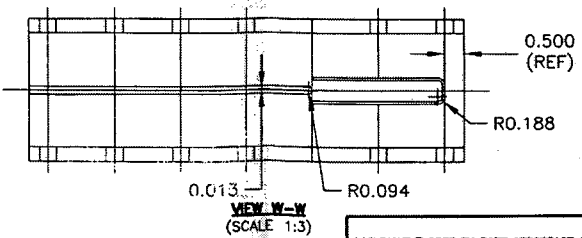
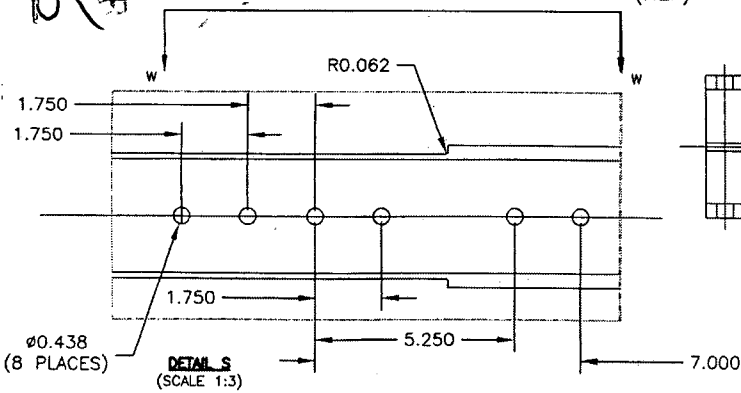
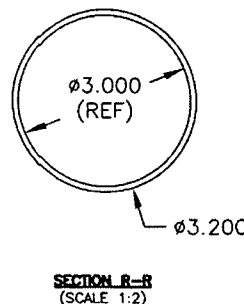
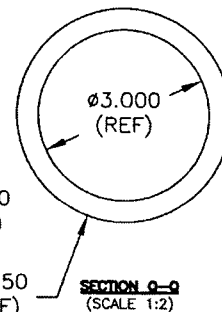
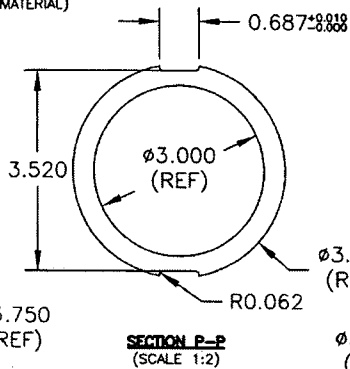
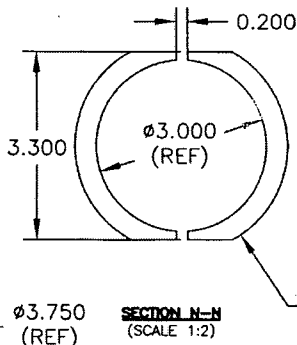
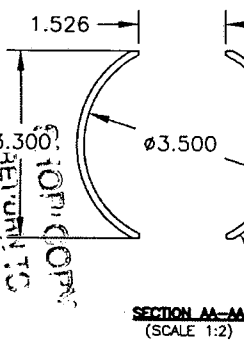
D3391-3 AFT DRILLING AND CUTTING DETAIL  
(MAKE FROM D6014-090 SKIDTUBE MATERIAL)



RELEASED  
05.11.14

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WITHOUT NOTICE

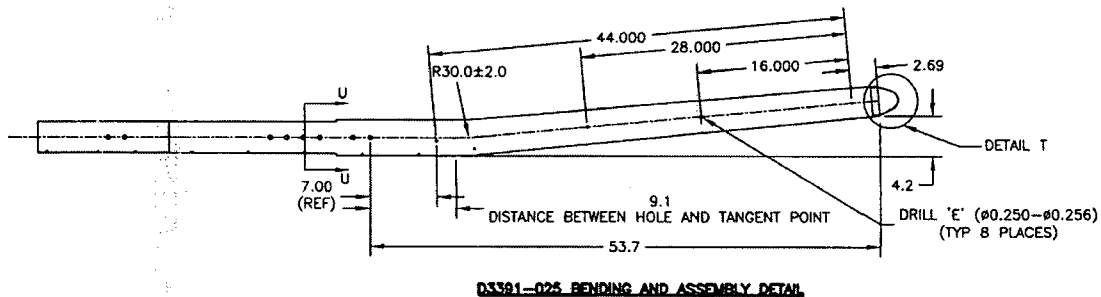
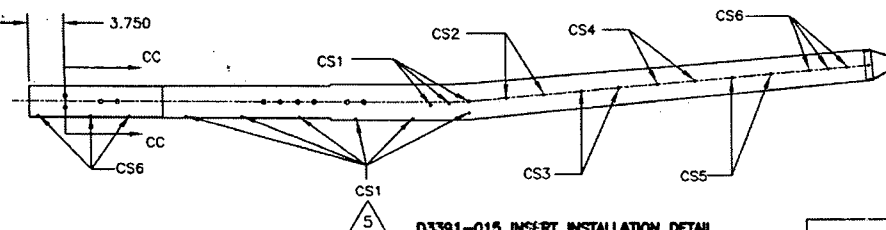
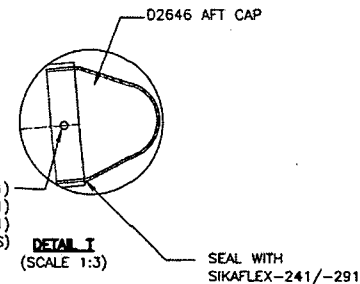
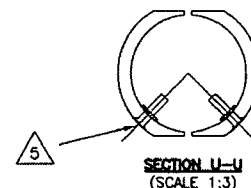
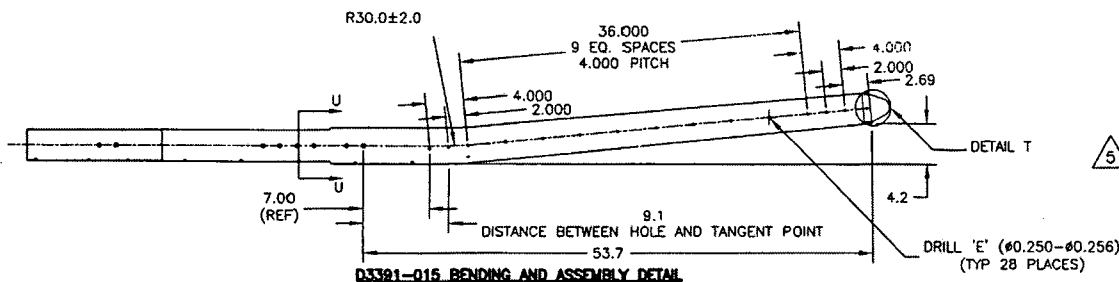
WORK ORDER  
NO. 25515



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PH	PH	PH	PH		
CHECKED	APPROVED	DRAWING NO.			REV. C
		03391			SHEET 4 OF 5
DATE		TITLE			SCALE
05.09.27		412 FLOAT SKIDTUBE			1:12

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RELEASED  
05.11.14

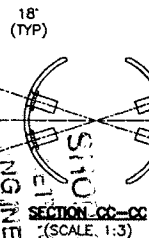


C'SINK AND INSTALL AESS10KBXXX AND/OR NAS1330C3KBXXX IN HOLES MARKED CS1-CS6 AS FOLLOWS

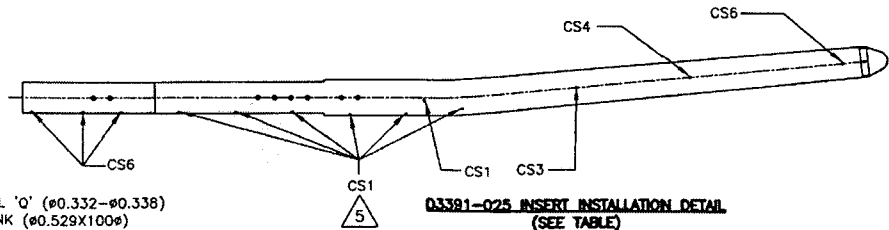
HOLES MARKED	QTY D3391-015	QTY D3391-025	C'SINK	P/N
CS1	18	14	Ø0.425	AESS10KB366
CS2	4		Ø0.391	AESS10KB366
CS3	4	2	Ø0.391	NAS1330C3KB316
CS4	4	2	Ø0.391	NAS1330C3KB266
CS5	4		Ø0.391	NAS1330C3KB216
CS6	12	8	Ø0.391	NAS1330C3KB166

D3391-015/-025 AFT TUBE ASSEMBLY PARTS LIST

QTY - 015	QTY - 025	PART NUMBER	DESCRIPTION
X		D3391-015	AFT TUBE ASSEMBLY
	X	D3391-025	AFT TUBE ASSEMBLY
1	1	D6014-090	AFT TUBE
1	1	D2646	AFT CAP
18	14	AESS10KB366	INSERT
4	2	NAS1330C3KB316	INSERT
4	2	NAS1330C3KB266	INSERT
4		NAS1330C3KB216	INSERT
12	8	NAS1330C3KB166	INSERT
4		NAS1330C4KB151	INSERT
2	2	AN3C4A	BOLT
2	2	NAS1515H3L	WASHER
2	2	AN960C10L	WASHER



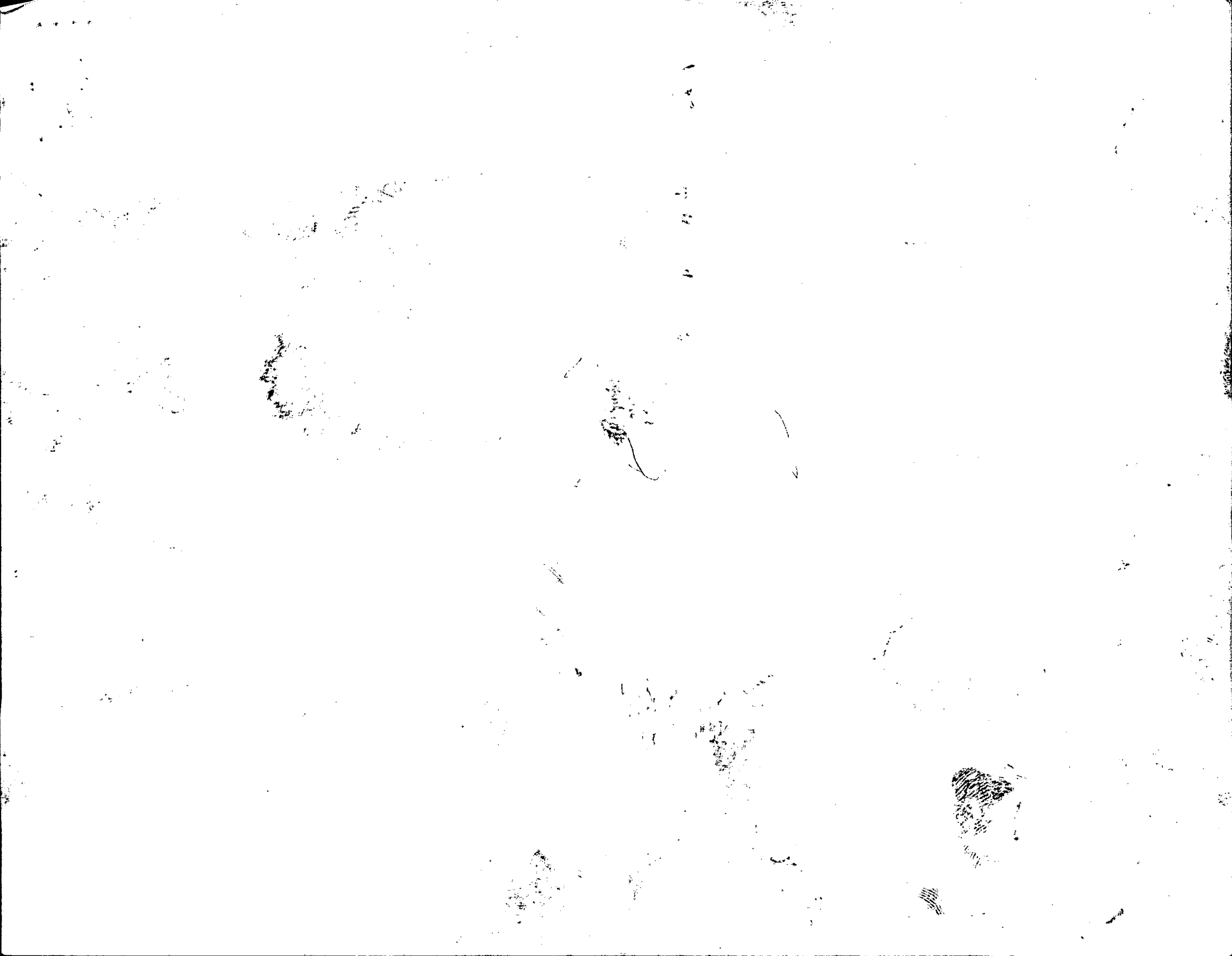
DRILL 'O' (Ø0.332-Ø0.338)  
C'SINK (Ø0.529X1000)  
NAS1330C4KB151 INSERT (1)  
(4 PLACES)



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DESIGN	PH	DRAWN BY	PH	<b>DART</b> DART AEROSPACE USA, INC. PORT HADLOCK, MA	REV. C
CHECKED	PH	APPROVED	PH		DRAWING NO. D3391
DATE	05.09.27	TITLE	412 FLOAT SKIDTUBE		SCALE 1:12

CONTROLLED COPY  
NO. 25515  
WORK ORDER  
WITHOUT NOTICE  
ENGINEERING





FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
0.687	$\pm .010$	0.690	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
3.580	$\pm .010$	3.612	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		see attached email PH 8.04.13
3.300	$\pm .010$	3.330	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
1.429	$\pm .030$	1.469	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
4.250	$\pm .016$	4.252	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
4.250	$\pm .010$	4.253	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
1.500	$\pm .010$	1.500	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
1.750	$\pm .010$	1.747	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
5.250	$\pm .010$	5.247	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
7.000	$\pm .010$	7.000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
00.484	$\pm .004$	00.484	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

Inspected by: PH  
 Date: 06/04/12  
 Audited by: EP  
 Date: 06/04/12  
 Prototype Approval: PH  
 Date: 06/04/13  
 Revised by: KJ/RP  
 Approved:

*[Handwritten signature]*

Peter Hum

---

From: David Shepherd [davids@dartaero.com]  
Sent: Thursday, April 13, 2006 3:19 AM  
To: Peter Hum  
Subject: Re: D3391-1 out of tolerance

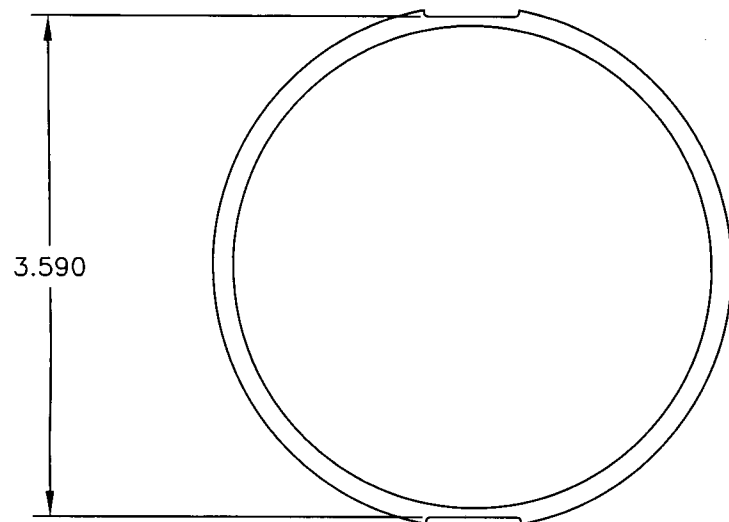
Assuming this part fits well with the mating part, these are acceptable deviations because the structure is not compromised.

David

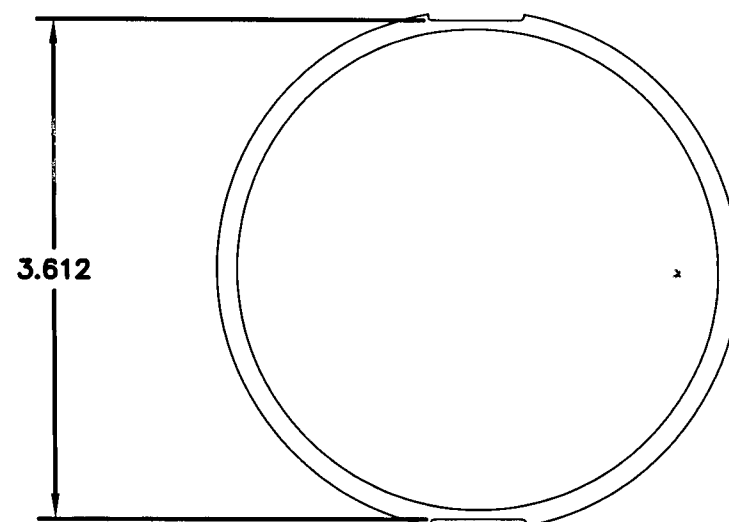
----- Original Message -----

From: "Peter Hum" <phum@dartaero.com>  
To: "David Shepherd (E-mail)" <davids@dartaero.com>  
Sent: Wednesday, April 12, 2006 2:42 PM  
Subject: D3391-1 out of tolerance

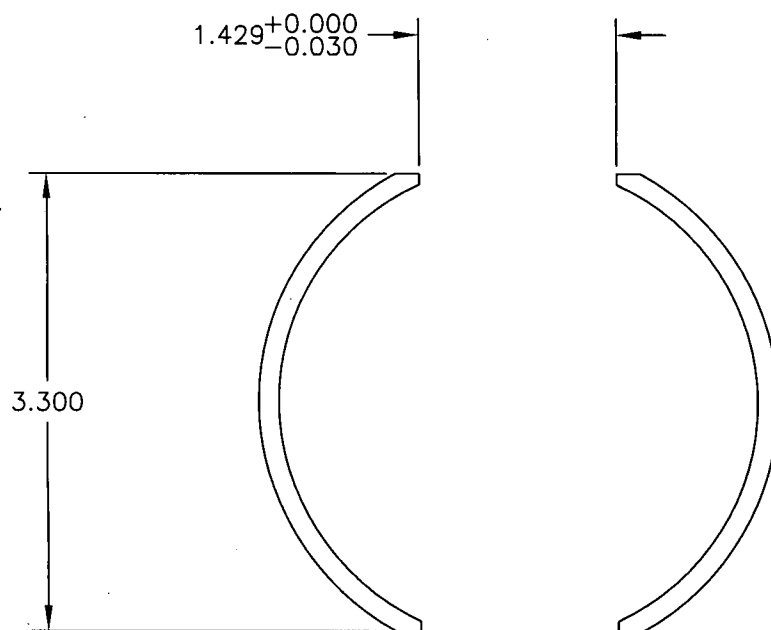
> David,  
>  
> I've attached a sketch to show the dimensions I am stating  
>  
> The 1st article inspection of the D3391-1 fwd tube is out of tolerance.  
>  
> The dimension 1.429(+0.000,-0.030) is 1.469  
> The dimension 3.300(+0.010,-0.010) is 3.030  
> The dimension 3.590(+0.010,-0.010) is 3.612  
>  
> In all cases the resulting section has more material  
>  
> Are these deviations acceptable?  
>  
>  
> Peter Hum  
> Mechanical Designer  
>  
> DART Aerospace Ltd.  
> Email...phum@dartaero.com  
> Phone...613-632-3336  
> Fax.....613-632-4443  
>  
>



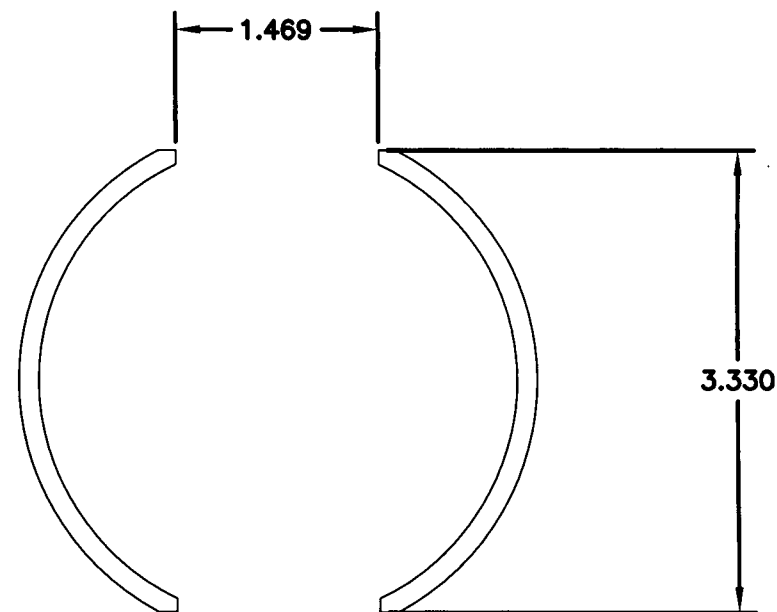
NOMINAL DIMENSION



"OUT OF TOLERANCE" DIMENSION  
 1) NET RESULT IS MORE MATERIAL  
 2) TUBE STILL FITS INTO MID TUBE



NOMINAL DIMENSION  
 AREA = 1.1853 IN<sup>2</sup>



"OUT OF TOLERANCE" DIMENSION  
 AREA = 1.1875 IN<sup>2</sup>  
 MORE MATERIAL

